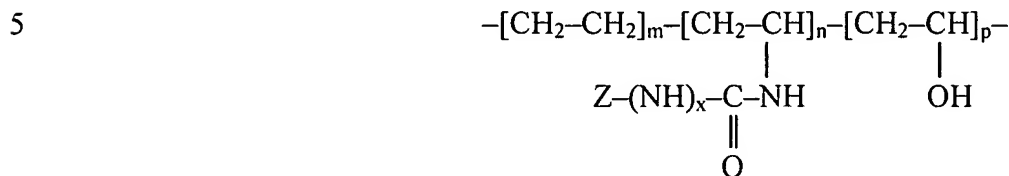


## CLAIMS

WHAT IS CLAIMED IS:

1. A medical article comprising an implantable substrate having a coating deposited on at least a portion of the substrate, the coating comprising a polymer having the formula:



- 10 wherein Z is a non-fouling moiety.

2. The medical article of Claim 1, wherein the non-fouling moiety comprises a derivative of a compound selected from a group consisting of a poly(alkylene glycol), heparin, poly(vinyl pyrrolidone), poly(2-hydroxyethylmethacrylate), poly(2-hydroxypropyl methacrylamide), poly(styrene sulfonate), hyaluronic acid, chondroitin sulfate, and chitosan.

- 15            3.            The medical article of Claim 2, wherein poly(alkylene glycol) is selected from a group consisting of poly(ethylene glycol), poly(1-propylene glycol), poly(2-propylene glycol) and poly(tetramethylene glycol).

4. The medical article of Claim 1, wherein the implantable substrate is a stent.

5. The medical article of Claim 1, wherein:

20  $m, n, o$  is each, independently, a positive integer;

$p$  is a positive integer or  $p = 0$ ;

the value of  $m$  is within a range of between about 30 and about 7,600;

the value of o is within a range of between about 11 and about 680;

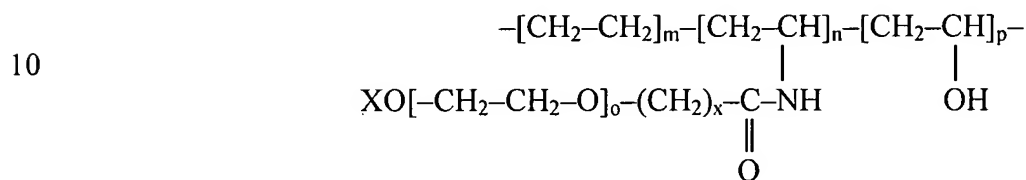
the value of the sum of n and p is within a range of between about 30 and about 7,600;

the sum of m, n and p is within a range of between about 700 and about 7,600; and

x = 0 or x = 1.

5            6.        The medical article of Claim 1, wherein a ratio between n and p is between about 1:19 and about 1:3.

7.        A method for fabricating a medical article, including synthesizing a polymer having a formula:



wherein X is hydrogen or methyl and the synthesis comprises:

15            (a) preparing a primary amino-functional poly(ethylene vinyl alcohol); and

(b) reacting the primary amino-functional poly(ethylene vinyl alcohol) with a succinimidyl derivative of poly(ethylene glycol).

8.        The method of Claim 7, wherein preparing the primary amino-functional poly(ethylene vinyl alcohol) further comprises:

20            (a) oxidizing poly(ethylene vinyl alcohol) to form a poly(ethylene vinyl alcohol) having ketone groups;

(b) reacting the poly(ethylene vinyl alcohol) having ketone groups with ammonia to form an imino derivative of poly(ethylene vinyl alcohol); and

(c) reducing the imino derivative of poly(ethylene vinyl alcohol).

9. The method of Claim 7, wherein:

5 m, n, o is each, independently, a positive integer;

p is a positive integer or  $p = 0$ ;

the value of m is within a range of between about 30 and about 7,600;

the value of o is within a range of between about 11 and about 680;

the value of the sum of n and p is within a range of between about 30 and about 7,600;

10 the sum of m, n and p is within a range of between about 700 and about 7,600; and

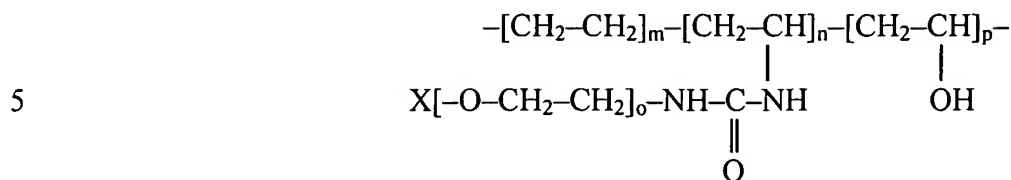
x is an integer having a value between 0 and 10.

10. The method of Claim 7, wherein a ratio between n and p is between about 1:19 and about 1:3.

11. The method of Claim 7, further comprising incorporating a drug into the polymer.

15 12. The method of Claim 11, wherein the drug comprises actinomycin D, estradiol, paclitaxel, docetaxel, heparin, low molecular weight heparins, heparinoids, heparin derivatives containing hydrophobic counter-ions, rapamycin, derivatives and analogs of rapamycin, clobetasol, or dexamethasone and derivatives thereof.

13. A method for fabricating a medical article, including synthesizing a polymer having a formula:



wherein X is hydrogen or methyl and the synthesis comprises:

(a) preparing a primary amino-functional poly(ethylene vinyl alcohol); and

10 (b) reacting the primary amino-functional poly(ethylene vinyl alcohol) with an isocyanate derivative of poly(ethylene glycol).

14. The method of Claim 13, wherein preparing the primary amino-functional poly(ethylene vinyl alcohol) further comprises:

(a) oxidizing poly(ethylene vinyl alcohol) to form a poly(ethylene vinyl alcohol) having  
15 ketone groups;

(b) reacting the poly(ethylene vinyl alcohol) having ketone groups with ammonia to form an imino derivative of poly(ethylene vinyl alcohol); and

(c) reducing the an imino derivative of poly(ethylene vinyl alcohol).

15. The method of Claim 13, wherein:

20 m, n, o is each, independently, a positive integer;

$p$  is a positive integer or  $p = 0$ ;

the value of  $m$  is within a range of between about 30 and about 7,600;

the value of o is within a range of between about 11 and about 680;

the value of the sum of n and p is within a range of between about 30 and about 7,600; and

the sum of m, n and p is within a range of between about 700 and about 7,600.

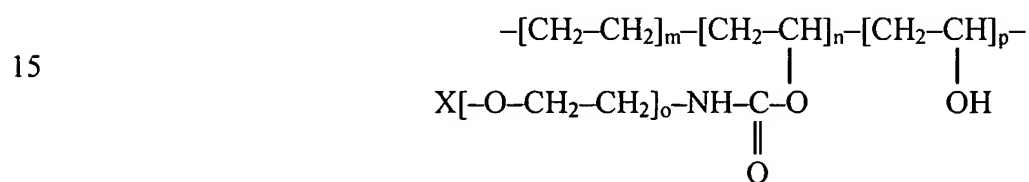
16. The method of Claim 13, wherein a ratio between n and p is between about 1:19

5 and about 1:3.

17. The method of Claim 13, further comprising incorporating a drug into the polymer.

18. The method of Claim 17, wherein the drug comprises actinomycin D, estradiol, paclitaxel, docetaxel, heparin, low molecular weight heparins, heparinoids, heparin derivatives  
10 containing hydrophobic counter-ions, rapamycin, derivatives and analogs of rapamycin, clobetasol, or dexamethasone and derivatives thereof.

19. A method for fabricating a medical article, including synthesizing a polymer having a formula:



wherein X is hydrogen or methyl and the synthesis comprises:

20 (a) reacting poly(ethylene glycol) or methoxylated poly(ethylene glycol) with N,N'-disuccinimidyl carbonate or with an aliphatic diisocyanate to obtain an activated derivative of poly(ethylene glycol) or methoxylated poly(ethylene glycol); and

(b) reacting the activated derivative of poly(ethylene glycol) or methoxylated poly(ethylene glycol) with poly(ethylene-co-vinyl alcohol).

20. The method of Claim 19, wherein:

m, n, o is each, independently, a positive integer;

5 p is a positive integer or  $p = 0$ ;

the value of m is within a range of between about 30 and about 7,600;

the value of o is within a range of between about 11 and about 680;

the value of the sum of n and p is within a range of between about 30 and about 7,600; and

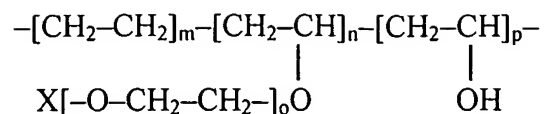
the sum of m, n and p is within a range of between about 700 and about 7,600.

10 21. The method of Claim 19, wherein a ratio between n and p is between about 1:19 and about 1:3.

22. The method of Claim 19, further comprising incorporating a drug into the polymer.

15 23. The method of Claim 22, wherein the drug comprises actinomycin D, estradiol, paclitaxel, docetaxel, heparin, low molecular weight heparins, heparinoids, heparin derivatives containing hydrophobic counter-ions, rapamycin, derivatives and analogs of rapamycin, clobetasol, or dexamethasone and derivatives thereof.

24. A method for fabricating a medical article, the method including synthesizing a polymer having a formula:



5 wherein X is hydrogen or methyl and the synthesis comprises:

(a) reacting poly(ethylene glycol) or methoxylated poly(ethylene glycol) with 1,4-dibromo-*n*-butane or with *bis*-epoxide to obtain an activated derivative of poly(ethylene glycol) or methoxylated poly(ethylene glycol); and

(b) reacting the activated derivative of poly(ethylene glycol) or methoxylated  
10 poly(ethylene glycol) with poly(ethylene-co-vinyl alcohol).

25. The method of Claim 24, wherein:

m, n, o is each, independently, a positive integer;

p is a positive integer or p = 0;

the value of m is within a range of between about 30 and about 7,600;

15 the value of o is within a range of between about 11 and about 680;

the value of the sum of n and p is within a range of between about 30 and about 7,600; and

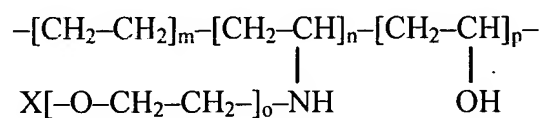
the sum of m, n and p is within a range of between about 700 and about 7,600.

26. The method of Claim 24, wherein a ratio between n and p is between about 1:19  
and about 1:3.

20 27. The method of Claim 26, further comprising incorporating a drug into the  
polymer.

28. The method of Claim 27, wherein the drug comprises actinomycin D, estradiol, paclitaxel, docetaxel, heparin, low molecular weight heparins, heparinoids, heparin derivatives containing hydrophobic counter-ions, rapamycin, derivatives and analogs of rapamycin, clobetasol, or dexamethasone and derivatives thereof.

29. A method for fabricating a medical article, including synthesizing a polymer having a formula:



wherein X is hydrogen or methyl and the synthesis comprises:

(a) oxidizing poly(ethylene-co-vinyl alcohol) to obtain an activated derivative of poly(ethylene-co-vinyl alcohol); and

(b) reacting the activated derivative of poly(ethylene-co-vinyl alcohol) with poly(ethylene glycol)-amine adduct.

30. The method of Claim 29, wherein:

m, n, o is each, independently, a positive integer;

p is a positive integer or p = 0;

the value of m is within a range of between about 30 and about 7,600;

the value of o is within a range of between about 11 and about 680;

the value of the sum of n and p is within a range of between about 30 and about 7,600; and



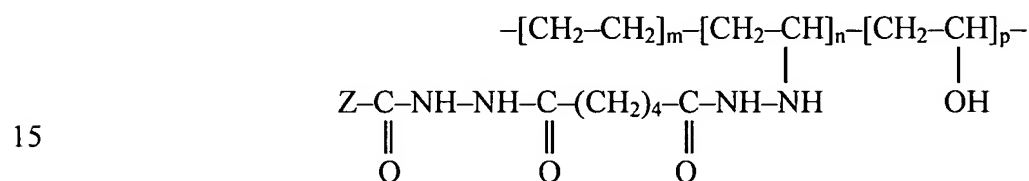
the sum of m, n and p is within a range of between about 700 and about 7,600.

31. The method of Claim 29, wherein a ratio between n and p is between about 1:19 and about 1:3.

32. The method of Claim 29, further comprising incorporating a drug into the polymer.

33. The method of Claim 32, wherein the drug comprises actinomycin D, estradiol, paclitaxel, docetaxel, heparin, low molecular weight heparins, heparinoids, heparin derivatives containing hydrophobic counter-ions, rapamycin, derivatives and analogs of rapamycin, clobetasol, or dexamethasone and derivatives thereof.

34. A method for fabricating a medical article, including synthesizing a polymer having a formula:



wherein Z is a moiety derived from hyaluronic acid and the synthesis comprises:

(a) oxidizing poly(ethylene vinyl alcohol) to form a poly(ethylene vinyl alcohol) having ketone groups;

(b) preparing a dihydrazide derivative of hyaluronic acid; and

(c) reacting the poly(ethylene vinyl alcohol) having ketone groups with the dihydrazide derivative of hyaluronic acid.

35. The method of Claim 34, wherein preparing the dihydrazide derivative of hyaluronic acid further comprises reacting hyaluronic acid with dihydrazide of adipic acid.

36. The method of Claim 34, wherein:

m and n, is each, independently, a positive integer;

5 p is a positive integer or  $p = 0$ ;

the value of m is within a range of between about 30 and about 7,600;

the value of the sum of n and p is within a range of between about 30 and about 7,600; and

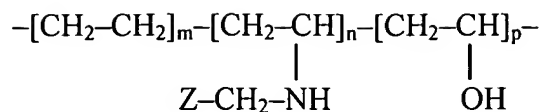
the sum of m, n and p is within a range of between about 700 and about 7,600.

10 37. The method of Claim 34, wherein a ratio between n and p is between about 1:19 and about 1:3.

38. The method of Claim 37, further comprising incorporating a drug into the polymer.

39. The method of Claim 38, wherein the drug comprises actinomycin D, estradiol, paclitaxel, docetaxel, heparin, low molecular weight heparins, heparinoids, heparin derivatives  
15 containing hydrophobic counter-ions, rapamycin, derivatives and analogs of rapamycin, clobetasol, or dexamethasone and derivatives thereof.

40. A method for fabricating a medical article, including synthesizing a polymer having a formula:



5 wherein Z is a moiety derived from heparin and the synthesis comprises:

(a) preparing a primary amino-functional poly(ethylene vinyl alcohol); and

(b) reacting the primary amino-functional poly(ethylene vinyl alcohol) with an aldehyde-terminated derivative of heparin.

41. The method of Claim 40, wherein preparing the primary amino-functional  
10 poly(ethylene vinyl alcohol) further comprises:

(a) oxidizing poly(ethylene vinyl alcohol) to form a poly(ethylene vinyl alcohol) having ketone groups;

(b) reacting the poly(ethylene vinyl alcohol) having ketone groups with ammonia to form an imino derivative of poly(ethylene vinyl alcohol); and

15 (c) reducing the an imino derivative of poly(ethylene vinyl alcohol).

42. The method of Claim 40, wherein in the polymer:

m and n, is each, independently, a positive integer;

p is a positive integer or p = 0;

the value of m is within a range of between about 30 and about 7,600;

20 the value of the sum of n and p is within a range of between about 30 and about 7,600; and

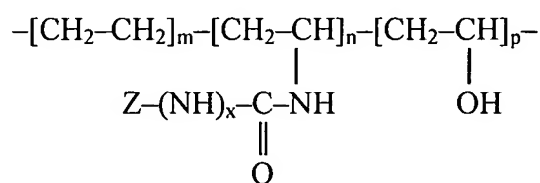
the sum of m, n and p is within a range of between about 700 and about 7,600.

43. The method of Claim 40, wherein a ratio between n and p is between about 1:19 and about 1:3.

44. The method of Claim 40, further comprising incorporating a drug into the polymer.

45. The method of Claim 44, wherein the drug comprises actinomycin D, estradiol, paclitaxel, docetaxel, heparin, low molecular weight heparins, heparinoids, heparin derivatives containing hydrophobic counter-ions, rapamycin, derivatives and analogs of rapamycin, clobetasol, or dexamethasone and derivatives thereof.

46. A method for fabricating a medical article, including synthesizing a polymer having a formula:



wherein Z is a non-fouling moiety.

47. The method of Claim 46, wherein the non-fouling moiety comprises a derivative of a compound selected from a group consisting of a poly(alkylene glycol), heparin, poly(vinyl pyrrolidone), poly(2-hydroxyethylmethacrylate), poly(2-hydroxypropyl methacrylamide), poly(styrene sulfonate), hyaluronic acid, chondroitin sulfate, and chitosan.

48. The method of Claim 47, wherein poly(alkylene glycol) is selected from a group consisting of poly(ethylene glycol), poly(1-propylene glycol), poly(2-propylene glycol) and poly(tetramethylene glycol).

49. The method of Claim 46, wherein:

m, n, o is each, independently, a positive integer;

p is a positive integer or  $p = 0$ ;

the value of m is within a range of between about 30 and about 7,600;

5 the value of o is within a range of between about 11 and about 680;

the value of the sum of n and p is within a range of between about 30 and about 7,600;

the sum of m, n and p is within a range of between about 700 and about 7,600; and

$x = 0$  or  $x = 1$ .

50. The method of Claim 61, wherein a ratio between n and p is between about 1:19

10 and about 1:3.